InterCAT Technical Working Group Meeting
December 17, 1998

Agenda Review and TWG Activity Summary: Paul Zschack reviewed the meeting agenda and designated speakers.

Facility Reports

APS Facility Update/News: (Steve Davey)
The service contract with Oxford for cryo pump maintenance is due for renewal. Once the proposal is received, it will be forwarded to the CATs to see if they want to continue with Oxford's maintenance service.

Liquid Nitrogen Distribution Update: (Bob Ferry)
The requests for proposals for the liquid-nitrogen system will be sent out before the holidays. The proposed safety aspects of the system have received favorable reviews. Proposals are expected back shortly.

XFD Services - liquid nitrogen & DI water: (Mohan Ramanathan)

1) Liquid Nitrogen System – The Oxford contract for system maintenance was $38K (not including any spares). The routine maintenance servicing (bearing change, leak checks, etc…) could be provided by the Beamline Operations Group on a cost recovery basis. This would require hiring additional manpower to maintain the systems, but would include immediate emergency response and access to spare parts. However, further R&D and upgrades cannot be assured. Regardless of who provides routine servicing (XFD or Oxford), XFD will maintain a spare pump for emergency use.

2) DI Water System – Many sectors rely on an XFD designed, CAT purchased DI water facility for their DI water requirements. These units require periodic inspection and maintenance, which can be provided by XFD. Average annual cost would be about $1.85K per year, including technician time. (See enclosed for cost breakdown). System maintenance would include weekly inspections of the pumping stations. Emergency on-call service would also be available. Any parts replaced outside those referenced in the quote and associated man hours of labor would be charged directly to the CATs. Parties interested in establishing this service should contact Craig Conley (ext. 2-5198).

Top-off Update: (Tony Rauchas)

ASD has continued efforts toward top-off capabilities. The feedback systems that were unavailable during the first top-off observations by users will be operational in future top-off studies. Effort has also been put towards periodic injection rather than current-triggered injection. An 8 hour shift on either 1 March or 2 March will be available for observations of the periodic injection mode. Further details will be made available as they become known.

CAT Reports

Newport Kappa Diffractometer Performance: Peter Eng (CARS-CAT) reviewed GSECARS' project to develop a new multi-axis diffractometer that would "push the limits" on maximum load capacity, minimum sample sizes, and the accuracy and speed of data collection. The unit has a basic two-plus-two configuration (two rotations each on the detector and sample). Eng reviewed the general history of the project beginning with design development and vendor selection in February 1996. Innovative modifications in the metrology of the diffractometer were implemented from the start. Newport began building the unit in February 1997. AutoCAD was used to share design progress between the CAT and Newport, allowing important modifications to be made to the design early in the process (e.g., optimizing the design to a 30º cone angle). Eng discussed the refinement and redesign of critical components and the various design problems that arose. The diffractometer was constructed of silicon carbide, steel, aluminum, and granite. It was installed in sector 13 in May of 1998. First experiments were carried out using the unit in July 1998, and upgrades are planned for February 1999.

Eng continued his report using overheads to review the geometry of the unit and illustrating its layout with a series of annotated photographs. The project also wanted to break new ground in the area of instrument control. Highlighted characteristics included closed-loop DC motors, advanced PID control, and a high-accuracy home switch with built-in origin search function. Eng shared some performance data with the group and discussed the results in detail. The diffractometer has many safety features, including multiple optical sensors to prevent the machine from colliding with itself, and an "acceptable following error" feature that shuts off power in the event the PID can't correct within a specified period of time.

PNC Activity Update: Steve Heald presented a status report overview on PNC-CAT. He showed the sector layout, noting that the CAT is just starting to build the BM line. The optical layout for the ID line includes a BESSRC-CAT-style monochromator, 3-27 KeV (Si 111). A toroidal mirror has been ordered that will be bendable to allow focusing into the second station. (The mirror has three coating stripes for harmonic rejection work.) Mono beam was brought into the hutches in March 1998, and the commissioning window was recently removed. PNC-CAT has accommodated a wide range of "non-developer" users. The UHV-MBE chamber was completed.

Basic capabilities on the BM line will emphasize spectroscopy and microbeams, as well as some work in the area of diffraction. Parts are being ordered and construction is beginning. The FOE has been validated (components have been ordered and are already arriving), improvements on the monochromator are being made, and the FDR finished.

The August/September run saw the first intensive round of experiments. Heald overviewed the experiments and summarized the distribution of the 28 users from the University of Washington, PNNL, and Simon Frasier University, among others.

News and Other Business

Tungsten (W) slits –DI Water Interactions: Tunch Kuzay stated that the problems seen in L5-90 slits at sector 3 improved when oxygen was removed from the DI water. Work continues to reduce the amount of dissolved oxygen in the DI water. Three samples have been sent for nickel plating to two different vendors to evaluate the efficacy of their plating processes. The samples

are being evaluated microscopically. Cost for plating is estimated at only $20 - $50 per unit based on quotes from vendors. Flanges will be sent in batch fashion to cut down on costs. Four CATs, MR-, SRI-, CMC-, and ChemMatCARS, will be asked to submit their unused L5-90s with blank flanges on the ends marked with the CAT name. Kuzay stated that they anticipate a short turn-around time for the plating service. New slit assemblies will be provided with slits of a new design as described at the Nov TWG meeting. Questions should be directed to either Tunch Kuzay (ext. 2-3084) or Jeff Collins (ext. 2-6770).

Next Meeting

After some discussion about either postponing the January TWG meeting by one month or holding it on its scheduled day (which coincides with the first day of the new run), it was decided that the meeting will be held January 21, 1999, in conference room A1100. CAT updates will highlight COM-CAT and SRI-CAT/sector 4.

Action Items

1. Poll CATs regarding opinion of Oxford cryo-cooler service proposal. (S. Davey)
2. Contact C. Conley for subscription to XFD service of DI plant. (All interested CATs).
3. Plan further activities for March top-off observations. (All CATs / top-off subgroup)